



566.43577X00

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Naoko IKEGAYA

Serial No.: 10/788,453

Filed: March 1, 2004

For: METHOD OF MONITORING STATUS INFORMATION OF
REMOTE STORAGE AND STORAGE SUBSYSTEM

**RENEWED REQUEST FOR RECONSIDERATION OF PETITION TO MAKE
SPECIAL UNDER 37 CFR §1.102(MPEP §708.02)**

MS Petition

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

July 27, 2005

Sir:

Applicants hereby renews its Petition to make this application **Special** previously submitted on February 16, 2005 along with a Preliminary Amendment and Information Disclosure Statement, in accordance with 37 CFR §1.102(d) and MPEP 708.02, VIII. The February 16, 2005 Petition was denied by a Decision issued on April 18, 2005 in which the Petitions Examiner stated that the February 16, 2005 Petition failed to recite distinct features of the claimed subject matter.

It should be noted that a further Preliminary Amendment and Information Disclosure Statement were filed on March 15, 2005. The March 15, 2005 Preliminary Amendment amended the then pending claims 13-22 and added new claims 23 and 24. However, the amended claims and the new claims are still directed to the invention as searched by the professional searcher. Accordingly, the search is applicable to the invention as now claimed.

The present Request for Reconsideration of Petition incorporates by reference the February 16, 2005 Petition and provides additional details regarding the claims and how the claimed subject matter is patentable over the references. The present invention is a new application filed in the United States Patent and Trademark Office on March 1, 2004 and as such has not received any examination by the Examiner.

(A) This Petition is accompanied by the fee set forth in 37 CFR §1.17(h).

The Commissioner is hereby authorized to charge any additional payment due, or to credit any overpayment, to Deposit Account No. 50-1417.

(B) All claims are directed to a single invention.

If the Office determines that all claims are not directed to a single invention, Applicant will make an election without traverse as a prerequisite to the grant of special status in conformity with established telephone restriction practice.

(C) A pre-examination search has been conducted.

The search was directed towards a storage system. In particular, the search was directed towards a storage subsystem, a computer system connected to the storage subsystem and a status information acquisition method. According to the present invention, a host computer acquires remote copy status information of storage systems that are not directly coupled to the host computer.

The present invention provides that each storage system includes a unit which receives a status information acquisition command from the host computer, a unit which analyzes the received command to judge whether the

storage subsystem is a target of the command, a unit which sends the command to a down-stream storage subsystem connected to the storage subsystem when the storage subsystem is not the target; and a unit which sends status information to an up-stream storage subsystem connected to the storage subsystem wherein the status information is received from the down-stream storage subsystem.

The search of the above features was conducted in the following areas:

<u>Class</u>	<u>Subclasses</u>
707/	DATA PROCESSING: DATABASE AND FILE MANAGEMENT OR DATA STRUCTURES
10	.Distributed or remote access
200	FILE OR DATABASE MAINTENANCE
201	.Coherency (e.g., same view to multiple users)
204	..Archiving or backup
711/	ELECTRICAL COMPUTERS AND DIGITAL PROCESSING SYSTEMS: MEMORY
114Arrayed (e.g., RAIDs)
162	...Backup

Additionally, a computer database search was conducted on the USPTO systems EAST and WEST.

(D) The following is a list of the references deemed most closely related to the subject matter encompassed by the claims:

<u>U.S. Patent Number</u>	<u>Inventors</u>
6,484,187	Kern et al
6,526,419	Burton et al
6,658,540	Sicola et al

U.S. Patent Application Publication No. Inventor(s)

2003/0078903
2002/0078296

Kimura et al
Nakamura et al

A copy of each of these references (as well as other references uncovered during the search) was submitted by the February 16, 2005 IDS.

(E) It is submitted that the present invention is patentable over the references for the following reasons.

It is submitted that the cited references, whether taken individually or in combination with each other, fail to teach or suggest the invention as claimed. In particular, the cited references, at a minimum, fail to teach or suggest as recited in the claims:

a first feature of the present invention as recited in independent claims 13 and 19 of a command down-stream sending unit which sends the status information acquisition command to a third storage subsystem that is located on a farther side of the first storage subsystem relative to the host computer and connected to the first storage subsystem, when the target storage subsystem judgment unit judges that the first storage subsystem is not the target storage subsystem from which the status information is to be acquired, and a down-stream status information acquisition unit which receives the status information from the third storage subsystem and which stores the received status information to be sent to the second storage into the outgoing status information storage unit;

a second feature of the present invention as recited in independent claim 18 wherein the status information acquisition unit acquires the status information of the first storage subsystem at status information acquisition time intervals stored in the status information acquisition command, to store the acquired status information into the outgoing status information storage unit, when the concatenation position judgment unit judges that the first storage subsystem is a storage subsystem located at a furthest position concatenated order relative to the host computer;

a third feature of the present invention as recited in independent claim 20 of a target storage subsystem judgment step in which the first storage subsystem analyzes the received status information acquisition command, to judge whether the first storage subsystem is a target storage subsystem from which status information is to be acquired based on the status information acquisition command, and a status information acquisition/sending step including a sub-step of when it is judged in the target storage subsystem judgment step that the first storage subsystem is the target storage subsystem, then, acquiring, by the first storage subsystem, the status information of the first storage subsystem and sending the acquired status information to the second storage subsystem;

a fourth feature of the present invention as recited in independent claim 21 of a self position judgment step in which the storage subsystem analyzes the received status information acquisition command and judges whether the first storage subsystem is a third storage concatenated at the farthest position in the sequence relative to the host computer, and a status information

acquisition/sending step including a sub-step of when it is judged in the self position judgment step that the first storage subsystem is the end storage subsystem, then, acquiring, by the first storage subsystem, the status information of the first storage subsystem and sending the acquired status information to second subsystem connected to the first storage subsystem;

a fifth feature of the present invention as recited in independent claim 22 of when it is judged that the storage subsystem is not the first storage subsystem, sending the status information of the third storage subsystem from the third storage subsystem to the second storage subsystem, receiving, in the second storage subsystem, the status information of the third storage subsystem and adding, in the second storage subsystem, the status information of the second storage system to the received status information of the third storage subsystem;

a sixth feature of the present invention as recited in independent claim 23 of an arithmetic unit which receives a status information acquisition command from a second storage subsystem that is located on a nearer side of the first storage subsystem seen from the host computer and connected to the first storage subsystem, judges whether a target storage subsystem from which the status information to be acquired specified in the status information acquisition command is the first storage subsystem, and sends the status information acquisition command to a third storage subsystem that is located on a farthest side of the first storage subsystem; and

a seventh feature of the present invention as recited in independent claim 24 of a status information acquisition unit which acquires status information of the first storage subsystem at status information acquisition time intervals stored in the status information acquisition command, to store the acquired status information into the outgoing status information storage unit, when the concatenation position judgment unit judges that the first storage subsystem is a storage subsystem located at a farther position in concatenation order seen from the host computer and acquires status information of the storage subsystem at the time of receiving status information from a third storage subsystem connected to and located on a farthest side of the storage subsystem in question seen from the host computer, and which adds the status information of the first storage subsystem to the received status information of the third storage subsystem, to store resultant status information to the status information storage unit.

Further, the cited references fail to teach or suggest the above noted features of the present invention when taken in combination with other limitations recited in the claims.

The references considered most closely related to the claimed invention are briefly discussed below:

Kern et al (U.S. Patent No. 6,484,187 B1) provides for Coordinating Remote Copy Status Changes across Multiple Logical Sessions to Maintain Consistency. Disclosed is a secondary DASD 122 not directly connected to a host 106 and maintained a consistent and concurrent image of a primary DASD

108. A system data mover 130 coordinates remote copy status changes (step 618) (see figures 1A-1B; and column 5, lines 6-9). However, Kern does not teach or suggest a storage subsystem or a method and apparatus for controlling a storage subsystem, wherein a technique is provided for collecting status information of a storage subsystem that is placed in a remote location and not directly coupled to a host computer.

More particularly, Kern at a minimum does not teach or suggest the above described first feature of the present invention as recited in independent claims 13 and 19, the above described second feature of the present invention as recited in independent claim 18, the above described third feature of the present invention as recited in independent claim 20, the above described fourth feature of the present invention as recited in independent claim 21, the above described fifth feature of the present invention as recited in independent claim 22, the above described sixth feature of the present invention as recited in independent claim 23 and the above described seventh feature of the present invention as recited in independent claim 24, and further does not teach or suggest these features in combination with the other limitations recited in each of the independent claims.

Burton (U.S. Patent No. 6,526,419 B1) provides for a Method, System, and Program for Remote Copy in an Open Systems Environment. Disclosed is a write command used to write status information to status storage areas indicating status of shadowed data at the secondary storage areas (in pairs) (see figures 1, 3; and column 2, lines 22-30 and 39-51). However, Burton does not teach or

suggest a storage subsystem or a method and apparatus for controlling a storage subsystem, wherein a technique is provided for collecting status information of a storage subsystem that is placed in a remote location and not directly coupled to a host computer.

More particularly, Burton at a minimum does not teach or suggest the above described first feature of the present invention as recited in independent claims 13 and 19, the above described second feature of the present invention as recited in independent claim 18, the above described third feature of the present invention as recited in independent claim 20, the above described fourth feature of the present invention as recited in independent claim 21, the above described fifth feature of the present invention as recited in independent claim 22, the above described sixth feature of the present invention as recited in independent claim 23 and the above described seventh feature of the present invention as recited in independent claim 24, and further does not teach or suggest these features in combination with the other limitations recited in each of the independent claims.

Sicola (U.S. Patent No. 6,658,540 B1) provides for a Method for Transaction Command Ordering in a Remote Data Replication System. Disclosed are two LUNs (logical units) 410 and 410'. The LUN X' (410') is used as a backup device of LUN X (410). A target controller B1 (of LUN X' (410')) sends a completion status back to an initiator controller A1. Once peer-to-peer remote copy (PPRC) manager 515 (in controller A1) has received a completion status from target controller B1, the manager 515 then notifies "value added"

(VA) 530 (then to host 101) (see figures 1, 4-5; column 8, lines 60-67; column 9, lines 1-28; column 12, lines 10-25; and column 13, lines 3-25). However, Sicola does not teach or suggest a storage subsystem or a method and apparatus for controlling a storage subsystem, wherein a technique is provided for collecting status information of a storage subsystem that is placed in a remote location and not directly coupled to a host computer.

More particularly, Sicola at a minimum does not teach or suggest the above described first feature of the present invention as recited in independent claims 13 and 19, the above described second feature of the present invention as recited in independent claim 18, the above described third feature of the present invention as recited in independent claim 20, the above described fourth feature of the present invention as recited in independent claim 21, the above described fifth feature of the present invention as recited in independent claim 22, the above described sixth feature of the present invention as recited in independent claim 23 and the above described seventh feature of the present invention as recited in independent claim 24, and further does not teach or suggest these features in combination with the other limitations recited in each of the independent claims.

Nakamura (U.S. Patent Application Publication No. 2002/0078296 A1) provides for a Method and Apparatus for Resynchronizing Paired Volumes via Communication Line. Disclosed is a disk array subsystem controller 120 and a service processor panel 121 on which a user can monitor an execution status of a remote copy. The MCV 102 manages a copy execution status of a paired

logical volumes formed by a pair of P-VOL 108 and an S-VOL-111 as a copy target. The 'duplex' and 'suspend' status can be transited by a command which is issued by the service processor panel 121 of the disk subsystem (see figures 1-2, 6-7; and paragraphs 8-9, 20, 28, 30, 34-35, and 45). However, Nakamura does not teach or suggest a storage subsystem or a method and apparatus for controlling a storage subsystem, wherein a technique is provided for collecting status information of a storage subsystem that is placed in a remote location and not directly coupled to a host computer.

More particularly, Nakamura at a minimum does not teach or suggest the above described first feature of the present invention as recited in independent claims 13 and 19, the above described second feature of the present invention as recited in independent claim 18, the above described third feature of the present invention as recited in independent claim 20, the above described fourth feature of the present invention as recited in independent claim 21, the above described fifth feature of the present invention as recited in independent claim 22, the above described sixth feature of the present invention as recited in independent claim 23 and the above described seventh feature of the present invention as recited in independent claim 24, and further does not teach or suggest these features in combination with the other limitations recited in each of the independent claims.

Kimura (U.S. Patent Application Publication No. 2003/0078903 A1) provides for an Information Storage System. Disclosed is a subsystem with a remote control unit 115 (disk units 110). A group status 333 indicates the

present status of the group (see figure 1; and paragraphs 23, 28, 30, 32, 33, and 48-49). However, Kimura does not teach or suggest a storage subsystem or a method and apparatus for controlling a storage subsystem, wherein a technique is provided for collecting status information of a storage subsystem that is placed in a remote location and not directly coupled to a host computer.

More particularly, Kimura at a minimum does not teach or suggest the above described first feature of the present invention as recited in independent claims 13 and 19, the above described second feature of the present invention as recited in independent claim 18, the above described third feature of the present invention as recited in independent claim 20, the above described fourth feature of the present invention as recited in independent claim 21, the above described fifth feature of the present invention as recited in independent claim 22, the above described sixth feature of the present invention as recited in independent claim 23 and the above described seventh feature of the present invention as recited in independent claim 24, and further does not teach or suggest these features in combination with the other limitations recited in each of the independent claims.

Therefore, since the cited references at a minimum fail to teach or suggest the above described first feature of the present invention as recited in independent claims 13 and 19, the above described second feature of the present invention as recited in independent claim 18, the above described third feature of the present invention as recited in independent claim 20, the above described fourth feature of the present invention as recited in independent claim

21, the above described fifth feature of the present invention as recited in independent claim 22, the above described sixth feature of the present invention as recited in independent claim 23 and the above described seventh feature of the present invention as recited in independent claim 24, and further fail to teach or suggest these features of the present invention in combination with the other limitations recited in each of the independent claims, it is submitted that all of the claims are patentable over the cited references whether said references are taken individually or in combination with each other.

(F) Conclusion

Applicant has conducted what it believes to be a reasonable search, but makes no representation that "better" or more relevant prior art does not exist. The United States Patent and Trademark Office is urged to conduct its own complete search of the prior art, and to thoroughly examine this application in view of the prior art cited herein and any other prior art that the United States Patent and Trademark Office may locate in its own independent search. Further, while Applicant has identified in good faith certain portions of each of the references listed herein in order to provide the requisite detailed discussion of how the claimed subject matter is patentable over the references, the United States Patent and Trademark Office should not limit its review to the identified portions but rather, is urged to review and consider the entirety of each reference, and not to rely solely on the identified portions when examining this application.

In view of the foregoing, Applicant requests that this Petition to Make Special be granted and that the application undergo the accelerated examination procedure set forth in MPEP 708.02 VIII.

Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, or credit any overpayment of fees, to the deposit account of MATTINGLY, STANGER, MALUR & BRUNDIDGE, P.C.,
Deposit Account No. 50-1417 (566.43577X00).

Respectfully submitted,

MATTINGLY, STANGER, MALUR & BRUNDIDGE, P.C.



Carl I. Brundidge
Reg. No. 29,621

CIB/jdc
(703) 684-1120